



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/632,322 | 08/01/2003 | Munenori Oizumi | TI-35909 | 5221 |

23494 7590 01/10/2007
TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

| |
|----------|
| EXAMINER |
|----------|

ROSARIO, DENNIS

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2624

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 01/10/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/632,322 | OIZUMI ET AL. | |
| | Examiner | Art Unit | |
| | Dennis Rosario | 2624 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

Figures 2a and 2b do not have the "b" of "box 'b'" as mentioned on page 4, section 2 of the specification.

Figure 3, label "n(x)" ought to be amended to "x(n)" as mentioned in the specification on page 4, line 19.

Figure 4, label "c(i)" ought to be amended to "c(k)" as mentioned in the specification on page 4, equation (1).

Figure 4 does not have labels "pattern (b)" and "pattern (c)" as mentioned on page 7, last paragraph of the specification.

Figure 5 does not have labels "pattern (a)" and "pattern (b)" and "pattern (c)" as mentioned on the top of page 5 of the specification.

Figure 5, label "n'(x)" ought to be amended to "x'(n)".

Figure 6 does not have a label indicating a power spectrum as mentioned in the specification on page 5, 2nd to last paragraph, first line that states:

"The schematic picture of a power spectrum is shown in figure 6."

However figure 6 shows three drawings. Which of the three drawings is the power spectrum?

Figure 6 does not show "negative values near $\omega=\omega_{th}$ " as mentioned in the specification on page 6, line 2.

Figure 12 does not show the "a" of "Figures 12a" as mentioned in the specification on page 9, last paragraph.

Figure 12 does not show the "b" of "Figure 12b" as mentioned in the specification on page 10.

Figure 13 does not show the "a" of "Figures 12a, 13a" as mentioned in the specification on page 9, last paragraph.

Figure 13 does not show the "b" of "Figure 13b" as mentioned in the specification on page 10.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the specification makes a comparison of images using figures 2a, 2b, 8, 9, 10 and 11-13; however, a visual comparison of the figures are difficult due to the quality of the figures.

For example, figures 2a and 2b have a box b that appear to be identical; however, box b of figure 2b has a distortion that is difficult to discern with respect to box b of fig. 2a.

Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

3. The drawings of figure 2a, 2b, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 are objected to because the figures include accompanying text that ought to be inserted in a respective portion in the BRIEF DESCRIPTION OF THE DRAWINGS section.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

The section CROSS-REFERNECE TO RELATED APPLICATIONS needs to be updated.

Page 1, line 10, "Figure 4" ought to be amended to "Figure 1b".

Page 4, line 22, "sptial" ought to be amended to "spatial".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1, limitation b) recites filtering which does correspond to fig. 1b, label: "pre-processing; JPEG compression" and limitation c) recites interpolating which does correspond to fig. 1b, label "CFA color interpolation;" however, the CFA color interpolation appears to be performed before the claimed filtering of claim 1, limitation b. In contrast, claim 1 is claiming interpolation after filtering.

Thus, how does one of ordinary skill in the art interpolate an image, using fig. 1b, label: "CFA color interpolation", after filtering, via fig. 1b, label: "pre-processing; JPEG compression", said image?

Upon further examination, limitation c) of claim 1 will not be given patentable weight for examination purposes since not enough support in the specification was found for the claimed interpolating.

In addition, the claimed filtering of limitation b) of claim 1 which corresponds to fig. 1b, label: "pre-processing; JPEG compression" the results of which appears to be written to flash as shown in fig.1b and not to the claimed interpolating limitation of claim 1c).

Claims 2 and 4 are rejected for the same reasons as claim 1.

Claims 3 and 5 are rejected for depending on a rejected parent claim.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Belykh et al. (US Patent 7,050,618 B2).

Regarding claim 1, Belykh et al. or Belykh discloses a method of image filtering, comprising:

- a) computing a modified auto-correlation (fig. 2,num. 44) in a first direction (fig. 2,num. 42) for each pixel in an image;
- b) filtering (fig. 2,num. 68) said image with a lowpass filter ("lowpass filter" in col. 6, line 51); and
- c) interpolating said image and said filtered image from step (b) wherein said interpolating at said each pixel depends upon said modified auto-correlation in a first direction (limitation c) and any dependencies thereof is not given patentable weight since not enough support was found in the specification).

Regarding claim 2, Belykh discloses the method of claim 1, further comprising:

a) after steps (a)-(c) of claim 1 repeating steps (a)-(c) of claim 1 with said first direction (or HORIZONTAL of fig. 2,num. 42) replaced by a second direction (or VERTICAL of fig. 2,num. 42), said second direction perpendicular to said first direction; and

b) with said image of step (c) replaced by said interpolated image using said modified auto-correlation in a first direction.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable Belykh t al. (US Patent 7,050,618 B2) further in view of Edgar (US Patent 6,442,301 B1).

Regarding the equation of claim 3, the structure of the claimed equation is not given patentable weight and only the variables of the equation are given patentable weight.

Regarding claim 3, Belykh teaches the method of claim 1, wherein:

- a) said modified auto-correlation of step (a) of claim 1 is $R_{xx}(1)/(R_{xx}(0)+\delta)$

where R_{xx} is the auto-correlation function (or “an auto-correlation function” in col. 5, line 32) for the pixel values in an interval about said each pixel (or “spatial pixel domain” in col. 5, lines 15,16.

However, Belykh does not teach the claimed:

- a) $R_{xx}(1)/(R_{xx}(0)+\delta)$; and
- b) DC component removed, and where δ is a parameter,

but does teach that auto-correlation and associated “numerical techniques... are well known” in col. 6, lines 26,27. Thus, Belykh suggests to one of ordinary skill in the art that a plurality of teachings of auto-correlation and associated numerical techniques exists and to apply any of the teachings of auto-correlation and associated techniques to Belykh's invention.

Edgar teaches auto-correlation in fig. 9B, num. 192 that could be used with He's invention and the remaining limitations of claim 3 of:

a) a modified auto-correlation is $R_{xx}(1)/(R_{xx}(0)+\delta)$ (or "gain measuring correlation" in col. 13, lines 49,50) where R_{xx} is the auto-correlation function (wherein said gain measuring correlation includes an "autocorrelation" in col. 13, line 49) for the pixel values in an interval (via a "3 X 3 element region" in col. 13, line 40) about said each pixel and with the DC component removed (or "eliminates the... 'DC' term" in col. 8, lines 29,30), and where δ is a parameter (or "nine" in col. 13, line 43 corresponding to said 3 X 3 element region that could be "larger" in col. 13, line 33; thus, said nine is a selectable parameter.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Belykh's teaching of auto-correlation with Edgar's teaching of auto-correlation, because Edgar's teaching provides a "corrected image" in col. 7, line 30 using "autocorrelation" in col. 7, line 29.

Regarding claim 5, Edgar of the combination teaches the method of claim 1, wherein:

a) said image is a color channel ("green image signals" in col. 4, line 32) of a color image.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mantegna et al. (US Patent 7,039,193 B2) is pertinent as teaching a method or DC removal with auto-correlation as shown in fig. 3,numerals 320 and 330.

He et al. (US Patent Application Publication No. : 2003/0100833 A1) is pertinent as teaching a method of lowpass filtering, (fig. 2A,num. 104 and "spatial domain low-pass filtering" in paragraph [0072],lines 23,24) and auto-correlation (fig. 2A,num. 114).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario whose telephone number is (571) 272-7397. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2624

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DR

Dennis Rosario
Unit 2624


DANIEL MIRIAM
PRIMARY EXAMINER